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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/692,135	10/19/2000	Roy C. Challberg	24-AT-5990	6878

7590

11/01/2002

John S Beulick  
Armstrong Teasdale LLP  
One Metropolitan Square  
Suite 2600  
St Louis, MO 63102-2740

EXAMINER

RICHARDSON, JOHN A

ART UNIT

PAPER NUMBER

3641

DATE MAILED: 11/01/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/692,135

Applicant(s)

CHALLBERG, ROY C.

Examiner

John Richardson

Art Unit

3641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1 ton 16 is/are pending in the application.
- 4a) Of the above claim(s) 5 and 13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 to 4, 6 to 12, 14 to 16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Final Rejection*

1). The applicant's response dated September 13 2002 (Paper No. 9) amending claims 1, 9 is acknowledged. Applicant's arguments filed in Paper No. 9 have been fully considered but they are not persuasive. Specifically the following comments are provided and additionally reasoning is included in the rejections that follow:

- Paper No. 9, page 3, attempts to use the fuel assembly feature of an **F-lattice** in a BWR fuel assembly to support the claim limitation of **large control rod**. It is noted that the applicant's claims to do not recite a BWR fuel assembly control rod nor in any sense such a fuel assembly configuration.
- Paper No. 9, pages 3, 4, refers to another patent (U.S. 6,097,779) in an attempt to demonstrate that a single pre-existing reference to an **F-lattice configuration** is sufficient to justify the claim limitation of **arranged in staggered rows** as being well known in the art. This reasoning is considered to be insufficient to show that other forms of staggered row configurations, such as; zig-zag configurations, alternating configurations, and over-lapping configurations cannot be implied by the said claim limitation.
- Paper No. 9, pages 3, 4, alludes to the consideration that the disclosure statement that **a large control rod** is about two times the width of a

conventional control rod. Is this meant to apply to a conventional control rod of any light water reactor, such as a PWR control rod, or a BWR control rod and if the latter is the term conventional applicable to a General Electric BWR of 600Mwe, 1200 MWE, an ABWR, or other vendor conventional designs such as Siemens, ASEA Atom of varying power output?

- Paper No. 9, pages 1, 6, the applicant in the Remarks section, relies on fuel assembly design features that are not recited in the rejected claims, such bundles surrounding each large control rod, extending radially from a central portion, arranged at right angle, inter-bundle support plate.
- Paper No. 9, pages 3, 4, the applicant's statements that a large control rod is well known in the nuclear art is not persuasive. It is the examiner's position that it is not possible to understand what is implied by large control rod without knowing precisely what it is the measure of comparison.

Art Unit: 3641

2). The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3). The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4). The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5). Claims 1 to 16 are rejected under 35 U.S.C. 112, first paragraph, for the reasons set forth in Paper No. 7, item 7), as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention, i.e., failing to provide an enabling disclosure.

Art Unit: 3641

There is no adequate disclosure of how and in what manner "arranged in staggered rows" is intended to be implemented. The specification merely states in pages 3, lines 1 to 19 that this relates to a so-called "**F-lattice configuration**" and it is noted that the claims do not recite either a **BWR** control rod nor a **F-Lattice configuration**.

6). Claims 1 to 16 are rejected under 35 U.S.C. 112, first paragraph, for the reasons set forth in Paper No. 7, item 8), as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention, i.e., there is no enabling disclosure.

Applicant's arguments filed in Paper No. 9 have been fully considered but they are not persuasive. Specifically, Paper No. 9, page 3, attempts to use the fuel assembly feature of an **F-lattice** in a BWR fuel assembly to support the claim limitation of large

control rod. It is noted that the applicant's claims do not recite a BWR fuel assembly control rod nor in any sense such a fuel assembly configuration. The applicant's

statements that a large control rod is well known in the nuclear art is not persuasive. It is the examiner's position that it is not possible to understand what is implied by **large control rod** without knowing precisely what it is being compared to and what is the measure of comparison

Art Unit: 3641

7). Claims 1 to 16 are rejected under 35 U.S.C. 112, second paragraph, for the reasons set forth in Paper No. 7, item 9), as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are vague, indefinite and incomplete as to what is meant by "arranged in staggered rows". The metes and bounds of the claims are undefined.

Applicant's arguments filed in Paper No. 9 have been fully considered but they are not persuasive. Specifically, Paper No. 9, pages 3, 4, refers to another patent (U.S.

6,097,779) in an attempt to demonstrate that a single pre-existing reference to an F-

lattice configuration is sufficient to justify the claim limitation of arranged in

staggered rows as being well known in the art. This reasoning is considered to be insufficient to show that other forms of staggered row configurations, such as; zig-zag configurations, alternating configurations, and over-lapping configurations cannot be implied by the said claim limitation.

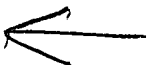
8). Claims 1 to 16 are rejected under 35 U.S.C. 112, second paragraph, for the reasons set forth in Paper No. 7, item 10 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The

→ term "large control rods" in claims 1 and 9 is a relative term, which renders the claim indefinite. The term "large control rod" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary

Art Unit: 3641

skill in the art would not be reasonably appraised of the scope of the invention.

Applicant's arguments filed Paper No. 9 have been fully considered but they are not persuasive. In particular, Paper No. 9, pages 3, 4, appears to allude to the consideration that the disclosure statement that a large control rod is about two times the width of a conventional control rod to support the limitation of large control rod. Is this meant to apply that the applicant is claiming that the invention control rod is twice as large as any a **conventional** control rod of any light water reactor? Would such reactors include **any** PWR control rod, or **any** BWR control rod? If the latter **BWR** is the type of light-water reactor that the term **conventional** is intended to refer, is this applicable to **all** types of BWR's such as General Electric BWR of 600Mwe, 1200 MWE, an ABWR, or other vendor **conventional** designs such as Siemens, ASEA Atom, ABB, Hitachi, Toshiba, and does this apply to **any size** of nuclear reactor power unit in this category with **varying** power outputs?



14  
9). Claims 1 to 4, 6, 9 to 12, are rejected under 35 U.S.C. 103(a) as being unpatentable over Dalke et al (U.S. 5,519,746).

The reference discloses a boiling water reactor (BWR) core plate assembly fuel channel design comprising a plurality of control rods (item 12), a plurality of cruciform shaped control rod guide tubes (item 86), a plurality of four fuel sub-bundles (items 26) having

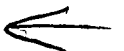


Art Unit: 3641

lower tie-plates (items 50, 150), a core plate detail of a flat plate (items P, P'), plurality of support beam type structures on top of the said plates for **each** fuel assembly (items 42), plurality of control rod guide tube openings arranged in a pattern across the reactor core (see Figure 2, detail showing openings / slots to receive control rod items 12), a plurality of fuel supports (items 40), the said supports beams (item 42) and fuel supports (item 40) providing a **combined** means for a plurality of fuel supports and **extending** through the said flat plates (items P, P') and said supports comprising a coolant flow inlet (item 62), a coolant flow outlet sized to receive the lower tie-plate (item 50) of the said fuel bundle (item 26), a coolant flow bore extending between said coolant inlets and outlets with said inlet **off-set** from said outlet with the said coolant flow inlet parallel to said coolant flow outlet (see Figures 4, 9 configurations).

As relating to claims 2, 10 the reference discloses control rod guide tube openings with four slots radially extending from a central location at right angles to each other (item 86), as relating to claims 3, 11 the venturi shaped coolant inlet sections of items 42, 142, provide a means of coolant flow pressure drop and are broadly readable on the orifice plate specified, see for example, Figure 5, item 90, as relating to claim 4 the fuel bundle receiving areas shown in Figure 4, item 54 and as relating to claims 6, 14, one fuel support per fuel bundle is disclosed in Figure 4, item 40.

The primary reference discloses the claimed invention except for the particular feature of providing fuel supports that pass through the said core assembly flat plate. It would have been obvious to one of ordinary skill in the art at the time of the invention to have designed the **combined** means of fuel supports (items 40, 42) as an **integral** unit, since



Art Unit: 3641

it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. Howard v. Detroit Stove Works, 150 U.S. 164 (1993). ←

10). Claims 7, 8, 15, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dalke et al (U.S. 5,519,746) as applied to claims 1 to 4, 6, 9 to 12, 14, in further view of Hirukawa (U.S. 5,267,286).

The primary reference has been discussed above and discloses the claimed invention except for reciting a plurality of coolant flow inlets. The secondary reference discloses ← that it is well known in the BWR nuclear reactor fuel art to provide a plurality of coolant flow inlets at the lower nozzle fuel assembly. It would have been obvious to one of ordinary skill in the art at the time of the invention to have substituted detail common inlet opening (item 62) of Dalke et al, with detail Figure 5C, items 67 of Hirukawa to ← facilitate void fraction control due to increased coolant pressure drop.

11). **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

Art Unit: 3641

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

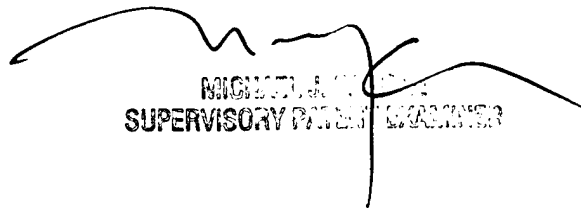
12). Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Richardson whose telephone number is (703) 305 0764. The examiner can normally be reached on Monday to Thursday from 7.00 AM to 4.30 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone, can be reached on (703) 306 4198. The fax phone number for the organization where this application or proceeding is assigned is (703) 305 7687.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 1113.

John Richardson, PE,

October 21 2002.

  
MICHAEL CARONE  
SUPERVISORY PATENT EXAMINER

Application/Control Number: 09/692,135  
Art Unit: 3641

Page 11